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The Experimental Bacterial Contamination of the Inner Structure of the Teats and the Milk of Cows

A. D. McEWEN AND J. McA. SAMUEL

ANIMAL DISEASES RESEARCH ASSOCIATION, MOREDUN INSTITUTE, GILMERTON, MIDLOTHIAN

The literature on mastitis contains numerous records of attempts to produce a streptococcal infection of the milk and a streptococcal mastitis by exposing the outside of the teats to infective material, infected milk or culture of streptococci, but many experiments have met with little success. Christiansen & Neilsen (1934), however, found that when the external orifice of the teat duct was injured infection of the udder could be produced with considerable regularity. As most cases of mastitis develop without any preceding injury of the teat sphincter these authors assumed that under natural conditions there must be some factors as yet unknown which govern the entrance of bacteria into the udder. An alternative to this assumption is that streptococci, particularly the widely-distributed *Streptococcus agalactiae*, although they frequently gain entrance to the teat duct, the teat cistern and to the milk cistern and ducts of the udder, may fail to colonize. Support to this latter hypothesis is provided by the many failures to set up an infection following the experimental introduction of moderate numbers of *Str. agalactiae* into the teat and udder cistern by means of a syringe or other instrument. If under field conditions repeated contamination of the teat duct and cistern and the adjacent udder structures may occur without the milk or the udder becoming infected, support would be gained for the popular view that an injury of some kind is necessary to render the udder susceptible to infection—an injury such as trauma caused by blows or treads which may not be accompanied by any break in the continuity of the skin of the udder or teat, an injury sustained through chilling of the udder or ill-defined injury caused by unsatisfactory milking. It has also been suggested that a specific bacterial sensitization may be brought about through repeated exposure to infection which renders the udder susceptible to bacterial mastitis (Jones & Little, 1934). None of these hypotheses regarding predisposing causes to mastitis is supported by definite experimental proof. The view is, however, very widely held that faulty milking, whether by hand or machine, is a common predisposing cause and in this country Watts (1942) has produced field evidence to show that in herds where one type of milking machine was used the incidence of mastitis was higher than in herds where another make of milking machine was employed. It is generally accepted that in machine milking a high negative pressure, or allowing the teat cups to remain on the teats after the milk has stopped flowing, is injurious and that either may predispose the udder to mastitis. If these or other factors in connection with machine milking, which may render the udder more susceptible to bacterial infection and mastitis, are to be submitted to experiment it would be desirable to determine whether teats exposed to a bacterial infection from without showed contamination of the teat duct, the teat cistern and the milk, and the exposure should be brought about without resorting to the inoculation of the bacteria into the teat duct by means of an instrument, as such a procedure would necessitate a mechanical interference with the teat sphincter which does not occur under normal milking conditions and would thus introduce an objectionable complication into any experiments designed to throw light on milking technique, management or practices as these may influence susceptibility to mastitis.

TECHNIQUE

The animals used were cows at the abattoir. The outsides of the teats were exposed to contamination with a 24 hours' culture of a strain of *Bacillus coli* designated M.1. Before exposure quarter samples of milk were collected for bacteriological examination. Shortly after exposing the teats to contamination with *B. coli* M.1 the cows were slaughtered. The udders were immediately recovered and the milk, scrapings from the internal orifice of the teat duct and, in some cases, scrapings of the mucous membrane of the teat cistern were examined bacteriologically for *B. coli*. In these examinations advantage was taken of the serological specificity of the flagellar antigen of individual strains of *B. coli*. Immune serum was prepared against the strain of *B. coli* M.1 and the somatic agglutinins absorbed by the homologous organism. The agglutination to titre by the flagellar antibody of strains of *B. coli* recovered from the udders was accepted as proof of the recovery and identification of the experimental strain.

The intact udders removed after slaughter were examined at the abattoir. The skin of the teats, except a small area around the external orifice, was cleansed with swabs soaked in strong hypochlorite solution and an area of skin one to two inches in width was seared along the length of the teat and the immediately adjacent portion of the udder. The seared skin was detached and removed from the underlying sterile tissues. These underlying tissues were seared and an incision was made with sterile instruments down to the teat cistern. Five to 10 c.c. of milk were withdrawn from the teat cistern by a pipette. The mucous membrane of the teat cistern was scraped with a scalpel and the material obtained inoculated into a tube of nutrient broth. The end of the teat was then gently inverted and the loose epithelial cells of the rosette around the internal orifice of the teat duct were removed by light scraping and transferred to a second tube of nutrient broth. In some instances the teat duct was incised from the inside to approximately half its length and the exposed walls scraped and the material therefrom inoculated into a third tube of nutrient broth. Milk samples and broth cultures and also milk samples collected before contaminating the teats were incubated overnight and then plated on McConkey medium. The McConkey plates after 24 hours' incubation were examined and portions of representative colonies that might be growths of *B. coli* were emulsified on a slide with saline and the flagellar serum and examined for agglutination. When agglutination occurred the remainder of the colony was inoculated into broth and the tubes were incubated overnight. The cultures obtained were centrifuged, the bacteria were resuspended in normal saline and the suspensions adjusted to a standard opacity for test tube agglutination tests with the flagellar serum. In no case was a culture of *B. coli* obtained from milk samples collected before contaminating the teats.

The technique used for the examination of the samples of material collected from the udders after the cows had been slaughtered was checked. Three cows were slaughtered and their udders removed. The whole lengths of the teats were then heavily contaminated with broth cultures of *B. coli* M.1 and the cultures allowed to dry on the teats. The usual bacteriological examinations of the milk, the inner orifice of the teat duct and of the mucous membrane of the teat cistern were made. In no instance was *B. coli* recovered from any of the twelve teats and quarters examined nor was the organism isolated from the upper half of the teat duct although this was examined in each instance. These examinations indicated that contamination of the upper half of the teat duct, the inner teat orifice and the mucous membrane of the teat cistern did not occur or did not occur readily after death. The experiments also showed that the technique used in collecting the materials for bacteriological examination prevented its accidental contamination by *B. coli* M.1 from the outside of the teat or udder.

To obtain an indication of the degree of contamination of the interior of the teat which might have to occur before *B. coli* M.1 was detectable, four cows were milked out and 1 c.c. quantities of suspensions of strain M.1 inoculated into the teat cisterns. The animals were then slaughtered and their udders examined. The results of these examinations are shown in Table I.

TABLE I

THE RESULTS OF BACTERIOLOGICAL EXAMINATIONS OF MILK COLLECTED FROM THE UDDER CISTERN AND OF SCRAPINGS FROM THE INTERNAL TEAT ORIFICE FOLLOWING THE INJECTION OF 1 C.C. OF A CULTURE OF *B. coli* M 1. INTO THE TEAT CISTERN BY MEANS OF A SYRINGE

No. of bacteria	Milk samples from cistern collected after slaughter		Scrapings from inner teat orifice	
	+ for *B. coli*	— for *B. coli*	+ for *B. coli*	— for *B. coli*
300 × 10^6	1	0	1	0
300 × 10^5	2	0	2	0
300 × 10^4	3	0	3	0
300 × 10^3	2	1	2	1
300 × 10^2	0	3	2	1
300 × 10	0	2	1	1
300	0	2	0	2

The experiment demonstrated the relatively large numbers of *B. coli* M.1 which have to be inoculated into the teat cistern before their presence may be detected in the milk or in scrapings from the inner orifice of the teat duct. These findings were supported by other tests where a glass rod with rounded end was dipped into a culture of *B. coli* M.1 and immediately inserted through the teat duct. The glass rod while in the teat was rotated as gentle pressure was applied to it in the teat cistern, by squeezing the teat lightly with the fingers. Two teats were treated in this manner with a rod contaminated with approximately 1,000 bacteria, two other teats were contaminated with approximately 10,000 bacteria and another two teats with 100,000 bacteria. After slaughter *B. coli* was not recovered from the milk of any quarter nor from the inner orifice of any of the teats.

Experimental Contamination During Hand Milking

Although primarily interested in testing the bacterial contamination of the inside of the teat that might be caused experimentally during machine milking, it was of interest to ascertain whether bacterial contamination occurred readily during hand milking. It appeared probable that contamination would occur, Davis (1935) having found that when teats submerged in a dye solution were milked by hand the dye could be demonstrated in a considerable number of the teat ducts after the animals were slaughtered, but in no case was the dye observed to ascend more than half the length of the teat duct and it did not reach the inner teat orifice. Espe & Cannon (1942) repeated the experiments made by Davis but instead of inserting the teat opening into a dye solution as milking pressure was released, the teats were inserted into a suspension of barium, and X-ray pictures were taken of the ends of the teats of 20 cows that had been treated in this manner. No barium was detected in the teat ducts. Espe & Cannon concluded that the chances of bacteria migrating up the teat duct into the teat cistern and thence gaining entrance to the udder were slight.

The experiments on the contamination of the teats of hand-milked cows are recorded in Table II.

Table II

Experiments to determine whether *B. coli* M.1 could be detected in the Milk in Scrapings from the Inner Orifice of the Teat Duct or in Scrapings from the Mucous Membrane of the Teat Cistern when the outside of the Teats was contaminated with Cultures of *B. coli* M.1 and the Animals were Milked by Hand

Method of contamination of teat	Bacteriological Examinations of quarters						No. of cows used	No. of cows with one or more quarters contaminated	
	Milk		Inner teat orifice		Mucous membrane of teat cistern			Milk	Inner teat orifice
	+	—	+	—	+	—			
Teats contaminated by immersion in a culture of *B. coli*. Cows not milked	0	8	0	8	0	8	2	0	0
Some milk was drawn from each quarter, the teats were then immersed in a culture of *B. coli*	No examination made		1	14	No examination made		4	0	1
The teats and hands were kept wet with a culture of *B. coli* and the udders milked out	0	8	0	8	2	6	2	0	2
While milk was flowing the teats were immersed in a culture of *B. coli* during 20 draws on the teats	0	18	5	17	0	4	6	0	4
Stripped with the teats immersed in a culture of *B. coli*	0	4	2	2	No examination made		1	0	1

In some udders referred to in Tables II and III all the teats were not suitable for examination owing to blind quarters and teats accidentally cut by the slaughtermen. In a number of cases examinations of the milk and the mucous membrane were not made.

The results of the above experiments indicated that bacterial contamination of the inner orifice of the teat ducts and of the lining membrane of the teat cistern occurred most readily when the teats were immersed in a culture while milking was in progress.

Experimental Contamination During Machine Milking

In the majority of the experiments with machine-milked udders the contamination of the outsides of the teats was accomplished by injecting 250 c.c. of broth culture of *B. coli* M.1 under a pressure of 5 lb. to the square inch on to the end of the teat when the teat cups of the milking machine were on the teats and the milking process was in operation. The teat cups used had stretched liners and through the base of each cup a metal tube was fitted with an 0·5 m.m. jet pointing upwards and the culture was sprayed through this jet on to the end of the teat, all four teats being contaminated at the same time. After contaminating the teats a small quantity of basic fuchsin was injected before the teat cups were removed. The staining of the tips of the teats by the dye was accepted as indicating that the ends of the teats had been effectively contaminated by *B. coli* M.1.

In the first experiments milking was carried out at a vacuum pressure of 15 lb. and at 32 to 34 pulsations per minute and the effect of contaminating the teats while the milk was flowing was compared with the effect of contaminating the teats after the milk had stopped flowing. In later experiments all contaminations of the teats were done after the milk had stopped flowing, and the respective effects of increasing the pulsation rate from 64 to 68 per minute and of reducing the vacuum pressure at milking to 8 lb. were tested. The results of these tests are summarized in Table III.

Table III

Showing the Results from the Contamination of Each Teat with 250 c.c. of a Culture of *B. coli* M.1 sprayed on the Teat while the Milking Machine Cups were on the Teats and the Machine working

Particulars of milking and contamination	Bacteriological examinations of quarters						No. of cows used	No. of cows with one or more quarters contaminated	
	Milk		Inner teat orifice		Mucous membrane of teat cistern			Milk	Inner teat orifice
	+	—	+	—	+	—			
A. 15 lb. pressure, pulsations 32 to 34. Contaminated while milk flowed	—	8	4	8	—	4	3	—	2
B. 15 lb. pressure, pulsations 32 to 34. Contaminated after milk had stopped flowing and machine left on teats for ten minutes	4	4	7	5	7	4	3	2	3
C. 15 lb. pressure, pulsations 32 to 34. Contaminated after milk had stopped flowing, machine then removed	7	25	10	22	8	20	8	6	8
D. 15 lb. pressure, pulsations 64 to 68. Contaminated as in C.	3	24	4	23	4	23	8	2	3
E. 8 lb. pressure, pulsations 32 to 34. Contaminated as in C.	4	12	9	7	6	10	4	3	4

It is seen from Table III that the inner teat orifice and the mucous membrane of the teat cistern were more frequently contaminated than the milk. However, as the orifice and the mucous membrane of the teat cistern are wetted by direct contact with the milk in the teat and udder cisterns and ducts a bacterial contamination of the inner teat orifice, or the mucous membrane of the teat cistern may be accepted as equivalent to a contamination of the milk in the udder.

Doubling the number of pulsations gave no indication that this was likely to increase the risks of contamination. Indeed there is a suggestion that an increase in the number of pulsations per minute decreased the risks of contamination of the inner structures of the teat.

A reduction in the pressure at which milking was carried out did not lessen the incidence of contamination; on the contrary it was associated with an increased incidence of contamination of both the teat tissues and the milk.

In a further experiment a comparison was made between stretched liners and moulded liners when the vacuum pressure at milking was 15 lb. to the square inch and the pulsations were 32 to 34 per minute. The spraying of culture on to the ends of the teats could not be done in tests where moulded liners were used. Accordingly, all the teats were contaminated after the milk had stopped flowing by removing the teat cups and inserting the teats into a culture of *B. coli* M.1. Thereafter the teat cups were again applied to the teats and the milking process continued for five minutes during which time the cups of the machine were again removed to permit a further contamination of the teats. Ten cows were milked with stretched liners and four with moulded liners. The usual tissues and fluids from the udders were examined bacteriologically. Contamination of the inner teat orifi

of one teat was found in a cow that was milked with moulded liners.

DISCUSSION

The experiments now recorded show that both in hand milking and machine milking a single exposure of the outsides of the teats to heavy bacterial contamination is sufficient to cause a bacterial contamination of the inner orifice of the teat duct in a relatively high proportion of teats. The bacteria contaminating the inner orifice may be regarded as "having gained entrance to the udder" in the sense in which that expression is commonly used in the literature on mastitis.

With hand milking the contamination of the internal teat orifice is readily accomplished when the teats are milked with their tips immersed in a liquid culture of the bacteria.

The experiments with machine milking showed, by spraying a culture of bacteria on to the ends of the teats with the machine cups on the teats and the machine working, that a bacterial contamination of the inner teat orifice and the teat cistern frequently occurred, and furthermore that contamination of these parts occurred when the milking machine was operating at pressures and pulsation rates within the ranges normally used. This method of contaminating the inner teat orifice and teat cistern would be appropriate for infection experiments with *Str. agalactiae* or with other organisms associated with mastitis, especially where the experiments were planned to try to throw light on suspected predisposing causes to a bacterial infection of the milk and to mastitis, whether these predisposing causes be related to the technique of machine milking or to other matters concerning the management of the cows and the care of the udder.

The contamination of the teats with the milking cups on the teats and while the milking proceeds has the advantage that except for that part of the teat within the teat cup the contamination of the skin of the udder is not excessive, and as the infective material used is collected in the milk bucket the contamination of the cow standings is reduced to a minimum. It is only the teats and particularly the ends of the teats that are wetted by the fluid containing the contaminating bacteria.

Were facilities available for milking a greater number of animals before slaughter than it has been possible to deal with in these tests, the bacterial contamination of teats during machine milking might be used to give further information on the techniques of machine milking and on the variations of the anatomical structure of teats, as these singly, or in combination, may facilitate or impede bacteria gaining entrance to the teats and udder.

Summary

The bacterial contamination of the inside of cows' teats has been demonstrated to occur in many teats when the outside of the teats is submitted to a heavy bacterial contamination during either hand or machine milking. The significance of these findings is discussed in relation to the experimental production of bacterial mastitis in the cow. The experiments were not designed to throw light upon practices relating to either hand or machine milking as these may be concerned with the occurrence of mastitis under dairying conditions, nor do they reflect upon these practices.

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AIR-BORNE LIVESTOCK FOR SALE IN MALAYA

Chicks from Australia are now on sale in Kuala Lumpur. The first lot of over 3,000 pedigree and cross-bred varieties fetched high prices and most of them were sold within a few hours. Packed in special carton crates, they are flown from Australia to Singapore. At present two local agencies are importing them. One imports directly from Australia, the other gets its shipments from its Singapore office. Several thousands more chickens are expected during the coming weeks. Arrangements have already been made for their transport twice a week from Singapore. Three-months-old puppies and six-months-old kittens are expected to be among the next livestock arriving by air.—*Colonial Office News Service.*

A consignment of poisonous snakes and other reptiles for the London Zoo has reached London airport in a B.O.A.C. Dakota from Takoradi, West Africa. All the reptiles were in good condition.

Some Observations Relating to the Critical Anthelmintic Test

by

J. F. A. SPRENT

(Cooper Centenary Research Fellow of the Veterinary Educational Trust)

Ministry of Agriculture Veterinary Laboratories, Weybridge

Introduction

By the critical anthelmintic test is meant the administration of a known dose of an anthelmintic drug to an animal of known weight by a uniform mode of administration, followed by collection and careful search for expelled worms in all the faeces passed by the animal until no more expelled worms appear in the faeces. The animal is then killed and the number of worms surviving in the alimentary canal is related to the number passed out in the faeces.

The advantages of this test over the other methods are discussed by Hall (1924, 1926) and again by Moskey & Harwood (1941). It has three disadvantages. Firstly, it cannot be used for drugs to be administered to human patients; secondly, it is practically impossible to carry it out on the small trichostrongylid nematodes of horses, cattle and sheep; and, thirdly, there is an unknown factor involved in its interpretation. This factor is the numerical relationship between the number of worms dislodged by the anthelmintic and the number which appear in the faeces. If all the worms dislodged are passed out in recognizable form the test should be very reliable, but if many of the dislodged worms are digested on their way to the exterior, a false interpretation is obtained; *e.g.*, if an animal that is treated passes out 200 worms and at autopsy is found to contain 50 worms, the original burden is regarded as 250 and the efficiency of the drug is regarded as 80 per cent.; but as we have no information regarding the number of worms which were dislodged and digested en route, the result only represents the minimal efficiency. The true percentage efficiency is $\frac{200+x}{250+x} \times 100$, where x equals the number of digested worms.

As the significance of this factor in the interpretation of the critical test has not been hitherto investigated, the writer undertook a series of experiments in an attempt to investigate this unknown factor. The results are described below.

Experimental Procedure

It was intended to insert into the duodenum of worm-free healthy sheep a known number of living hookworms (*Bunostomum trigonocephalus*) and then to perform the critical test in the usual way with various drugs. By this method the number digested could be discovered. Accordingly, under intravenous nembutal anaesthesia, a Perspex cannula was inserted into the duodenum, two inches from the pylorus, in a two-year-old ewe weighing 80 lb. The cannula was a modification of that used by Dr. A. T. Phillipson of the Department of Physiology, University of Cambridge, who very kindly advised me on the operative technique. This was modified for the sheep after the method described by Markovitz (1937) for the dog.

Hookworms were used because of their convenient size; they were obtained from the Metropolitan Slaughter House, Islington, London. The intestinal contents of the slaughtered sheep were strained through muslin at the slaughterhouse and brought in a large glass jar to Weybridge. On the same day the worms were picked out by hand, washed in Locke's solution kept at 37° C., and inserted by means of a funnel and rubber tubing through the cannula into the duodenum. As it was not possible to obtain more than about 200 hookworms on one day, several batches of worms were inserted and every day the faeces were searched for expelled worms so that the total burden could be estimated. Twice weekly, erythrocyte counts, haemoglobin estimations and faecal egg counts were performed as a guide to the presence of living worms. In 14 days 876 female and 481 male hookworms had been inserted and 156 female and 96 male hookworms had been recovered from the faeces. It was therefore expected that the total worm burden of the sheep would be 720 female and 385 male hookworms. It was evident, however, from the uniformity of the blood findings and the small number of eggs in the faeces that the sheep was harbouring only a very few hookworms and that the performance of a critical test would not be profitable. The sheep was then put out to pasture for a week and no faeces were collected. As the faecal egg count remained very low it was decided to kill the sheep. At autopsy only 15 female and 10 male hookworms were found; in fact, 705 female and 375 male hookworms

were missing. The faeces of the sheep, except for the week at pasture, had been very carefully collected in a bag strapped to its hind parts, and the floor of its pen had been searched for any faeces which might have fallen from the bag. All the faeces were carefully searched, after washing in a sieve of 120 meshes to the square inch, by taking about 1 gm. faeces in the fingers and dropping into a Petri dish (six-inch diameter) full of water. The whole mass of faeces was examined in this way.

It was evident that a very considerable mortality had taken place and that out of 1,332 hookworms which had failed to inhabit the intestine, 1,080 had disappeared. The experiment had to be repeated, however, because a week had elapsed without the collection of faeces, and a second sheep was given 202 female and 98 male hookworms by inserting them through a cannula into the duodenum. All its faeces were collected and searched for six days afterwards. Eighty-three female and 52 male hookworms were recovered. It was then killed and only two female hookworms were found in the gastro-intestinal tract. Here again, without any possibility of their being overlooked, of 298 hookworms which had failed to establish themselves, 163 had disappeared.

It appeared that the process involved in obtaining the hookworms and transporting them to the laboratory resulted in most of them being unable to establish themselves in the intestine and that consequently the majority of the worms inserted through the cannula travelled with the intestinal contents towards the colon or into the abomasum. Some of them were recovered in the faeces in an intact state with darkened blood still visible in their intestines, but most of them had entirely disappeared.

Failure to establish a large enough infestation precluded the performance of critical tests, but the disappearance of these worms was, in itself, a phenomenon which was of interest in connection with the interpretation of the test. The problem resolved itself into that of discovering the fate of the missing worms. Two possibilities offer themselves. Firstly, that they were digested in the abomasum or intestine; secondly, that they had lodged in the caecum and disintegrated by decomposition.

In order to test the second possibility a third sheep was employed and 48 strips of rubber of a length and diameter similar to that of the female *Bunostomum trigonocephalus* were inserted into the cannula. In the first experiment of this kind 44 strips were recovered within the first 24 hours and by 42½ hours the remaining four were recovered. In the second test 32 were recovered in 19 hours and by 43 hours the remaining 16 were recovered. The recovery of all these rubber strips indicated that worms passing backwards along the intestines are not likely to lodge in the caecum.

If digestion had been the cause of the disappearance of the worms in the first and second experiments, it was difficult to understand why any worms were recovered in the faeces; why, in fact, they were not all digested. It was of interest in this connection that the worms recovered in the faeces were not, as might be expected, partially digested, but were with very few exceptions quite intact.

To investigate this question a sheep was given through a duodenal cannula 100 female hookworms which were killed with 70 per cent. alcohol and thoroughly rinsed in water before insertion. After six days' search of the faeces no worms were found. It appeared therefore that dead worms in the small intestine are all digested. Two weeks later another 98 female hookworms, similarly killed, were inserted and at the same time ½ lb. magnesium sulphate in 200 c.c. of water was administered orally. The purgative effect was evident on the next morning but no worms were recovered up to six days later. This sheep was then killed and its alimentary tract searched from oesophagus to anus without finding any hookworms.

Discussion

From the above findings it appears probable that when fresh hookworms were placed into the duodenum, some of them were capable of establishing themselves in the intestine, others died in the small intestine where they were digested by the intestinal secretions of the host and never appeared in the faeces. The remainder, although unable to attach themselves to the mucosa, were probably alive during their passage through the small intestine and died in the colon, but being beyond the zone of secretion of digestive enzymes escaped digestion and appeared in the faeces. This would explain why the worms recovered in the faeces were not disintegrated.

If this be a true interpretation of the facts, the findings are of interest in the interpretation of the critical anthelmintic test. After a drug has exerted its influence on the parasite population it is likely that some of the worms will remain alive and attached to the mucosa, others will be dislodged and, unable to regain their hold, will be expelled in the faeces, while the remainder will die and be completely digested. It is evident therefore that the results of the critical test are not representative of the true efficiency of the drug and that the more lethal the drug the less information does the test give of its efficiency.

Several workers have pointed out this possible flaw in the test: Moskey & Harwood (1941); Sprent (1946); and Steward (private correspondence). Steward finds that in the successfully treated animals the sum of worms recovered from the faeces and from the viscus on *post-mortem* examination is invariably less than those averaged in the untreated and unsuccessfully treated groups, suggesting that digestion of many of the worms in successfully treated animals has proceeded. He criticizes, quite rightly, the critical tests of the present writer (see Sprent, 1946), pointing out that several of these tests which showed a low efficiency may in fact have been more successful than they appeared, owing to digestion of the killed worms.

Summary

By the insertion of adult hookworms (*Bunostomum trigonocephalus*) into the duodenum of sheep by means of a permanent cannula, it was shown that some of the worms attach themselves to the duodenal wall, others are expelled in the faeces, while the majority are completely destroyed, and are not recoverable in the faeces. As dead hookworms placed in the cannula are not recovered in the faeces, it appears that on the death of the worm it loses the power to resist digestion. The findings are of interest in the interpretation of the critical anthelmintic test and confirm the opinion of several workers that this test has a serious flaw. It appears likely that when an anthelmintic drug has exerted its effect on a population of parasites, some are unharmed and remain in the viscus; others are intoxicated and swept backwards to the colon, but resist digestion and can be recovered in the faeces; while those killed by the drug are completely digested. Hence the critical test gives an indication of the parasites dislodged and intoxicated but not of the total number destroyed.

These results cast no doubt upon the value of a drug found to be efficient by the critical test, but they do suggest that the condemnation of a drug on its performance in the critical test is unwarranted.

Acknowledgment.—This work was carried out at the Ministry of Agriculture Veterinary Laboratories, New Haw, Weybridge. The writer is indebted to Professor T. Dalling for his kindness in allowing him to work at the Laboratory.

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ENRICHMENT OF NATIONAL PIG AND POULTRY COMPOUNDS

An Order, dated October 22nd, 1946, has been made, amending the Feeding-stuffs (Regulation of Manufacture) Order, 1944, the purpose of the Amending Order being to increase the animal protein rich substances in all National Pig and Poultry Compounds and to make the inclusion of these substances obligatory in National Cattle Food No. 3.

The Order also increases the percentage of wheat by-products in National Horse Food and makes the inclusion of cod-liver oil in National Pig Food No. 1 obligatory.

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BETTER OUTLOOK FOR FEEDING-STUFFS IN N. IRELAND

The Minister of Agriculture (the Rev. Robert Moore) has informed the Northern Ireland House of Commons that recent good weather has transformed the whole crops situation in the country. Taking Northern Ireland as a whole, not more than 10 per cent. if that, of the whole crop has been wasted. No such calamity as a prospective famine in feeding-stuffs for livestock is now anticipated.

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"Steady progress," states *Ulster Commentary*, "is being made with the immprovement and expansion of Ulster's health services. Evidence of this is to be found in a Note by the Minister of Health appended to the first annual report of his Health Advisory Council. The report sets out the Council's recommendations, and the Minister's observations show the extent to which action has followed. For instance, steps are being taken to introduce a scheme of health education not only for children but for the whole population. The provision of milk and meals in schools is being extended to every district as rapidly as possible."

THE VETERINARY RECORD

November 9th, 1946

LIVESTOCK SURVEYS IN THE COLONIAL EMPIRE

LAST year the Development and Welfare authorities in the West Indies desired an authoritative and constructive survey of the livestock position and veterinary services in Trinidad and Tobago,* and they are to be congratulated on their choice of Professor W. C. Miller for this assignment. His report provides a good example of what a modern veterinarian can and should be able to do in the way of a concise but nevertheless a comprehensive examination of an animal husbandry and livestock project in the Colonies or elsewhere.

The essential basic qualities of the present M.R.C.V.S. courses are not sufficiently appreciated even by some members of our own profession, for it is this fundamental knowledge of health and disease and its subsequent application to practical livestock management, feeding, etc., which enables a man who knows his job to advise on the problems of the husbandry of domestic stock, whether under temperate or tropical conditions. It is under these latter conditions that a veterinary qualification is even more desirable owing to the ever-present threat of disease which can, and does, retard or completely nullify livestock development schemes.

*Survey of Animal Husbandry, feeding, management and veterinary services in the West Indies. Trinidad and Tobago report by Professor Wm. C. Miller, M.R.C.V.S., F.R.S.E.

CLINICAL COMMUNICATION

Treatment of Traumatic Lesions of the Tendo-Achilles By Means of Joint Fixation Using the Stader Splint

by

LOUIS N. GLEESON, V.M.D. (BERNE), M.R.C.V.S.

Case I

A greyhound pup aged six months whose hind limb was caught in a door. The tendo-Achilles about one inch above the Os Calcis, was subjected to a crushing or "Burdizzo"-like action between the door and door-post. The skin was not sectioned, and the dog did not bear weight upon the leg for two days following the accident, after which time when he placed it upon the ground, the tendon stretched out, something after the manner of a roll of soft chewing-gum when pulled in opposite directions, a thin part, consisting of peritendoneum only, remaining as a communication between the crushed ends. Excessive flexion of the tarsus existed, the animal practically walking on his entire metatarsus.

Treatment.—Using 2 per cent. Novutox for nerve block and local infiltration anaesthesia, the tendo-Achilles was cut down upon. The intervening overstretched portion of peritendoneum was sectioned proximally and by means of tarsal extension the crushed ends were brought into apposition. The opposing ends were freshened carefully with a razor blade, being sectioned in an oblique manner in order to obtain the largest possible opposing surfaces. A mattress fixation suture of 20-day catgut was used for the main opposing surfaces. The free loose portion of peritendoneum about one inch long, now hanging loosely from the distal newly stitched end of tendon, was in turn stitched into the posterior aspect of the proximal part of the tendon, the latter being scraped before attachment. In the latter part of the operation lighter gut was used. A large figure-of-eight relaxation suture completed the work upon the tendo-Achilles. The skin incision was closed with interrupted sutures. Local anaesthesia was now renewed and the upper pin-bar assembly of a Stader Utility Splint was fixed with half-pins to the lower lateral extremity of the tibia, the distal half-pin being inserted just above the outer malleolus. The lower pin-bar assembly having been placed into a piece of shaped hard-wood, was attached to the previously padded antero-lateral aspect of the upper extremity of the metatarsus by means of a plaster bandage. A little time was allowed for the lower pin assembly to harden into position. Slight relaxation of the tendo-Achilles was practised by the assistant, and the extension bar assemblage applied to the pin assemblies. Adjustments were made so that the joint was maintained in the extended position, thus immobilizing the repaired tendon. The projecting pins were cut off close to the pin-bars. A rubber stockinette was applied over the instrument, being held above and below with Flexoplast. A speedy daily dressing of the wound was carried out, using sulphanilamide in aether. The animal was kept muzzled for the first few days, but as he made no attempt to interfere with the apparatus, the muzzle was removed.

Results.—Four weeks later, the wound having healed, and the tendon feeling quite firm and thickened at the site of union, the extension bar assemblage was lengthened, thus relaxing the slight over-extension of the joint. The animal cheerfully romped around in the manner of greyhound pups and used the limb. At five weeks the bar was further extended, placing a little tension on the tendon in the manner of joint extension. At seven weeks the pins were extracted, and the animal returned home, directions being given to dress the pin sites. At three months later, the animal was seen and apart from a decreasing thickness of the tendon, he was normal upon the limb. On account of the youth of the subject, it is believed that 100 per cent. success is assured.

Case II

A greyhound bitch aged 14 months, she had received, by accident, a stroke of a scythe which completely severed the tendo-Achilles. The case was received in fresh condition. It was necessary to shorten the tendon very slightly in order to obtain the large oblique presenting surfaces for union. Twenty-day gut was used for the fixation and relaxation sutures. No antiseptic was used on the wound, the latter being irrigated out with saline. The oblique accidental skin wound was closely sutured. The Stader Splint was applied as in Case I. One hour after suturing the skin wound 20,000 units of penicillin was administered, some of the injection being given in the neighbourhood of the wound. Similar dosage and procedure was carried out every eight hours until 100,000 units had been used. Subsequent procedure consisted of daily raising of the stockinette and dressing the wound with sulphanilamide in aether.

Results.—After six weeks the extension bar was lengthened as in Case I with a further extension adjustment at seven weeks and total removal of the apparatus at eight weeks. Some slight interim plaster bandage attention was necessary to the plaster-incorporated pin-assembly of the metatarsal extremity, and due to the latter attention, movement did not occur. Three months after operation it was obvious that 95 per cent. successful result had been obtained.

. . . . . .

Before using the above Stader Splint procedure in such cases, the writer favoured application of the closed plaster method following tendon repairs. Due to plaster deterioration it was necessary to renew the cast about every eight or ten days. The usual closed plaster stench existed in these cases but healing was not interfered with. Four to six renewals of plaster were necessary before the tendon was fit to bear weight. Disadvantages of the method included the frequent renewals, bad adour, incomplete immobilization, inability to attain first intention healing. Despite the above, however, the writer has had good results, especially in pups.

Advantages of the Stader Fixation method include, definite immobilization of the joint with consequent relaxation of the tendon in the healing stage, and facilities for antisepsis and rapid wound repair. Occasionally, in the closed plaster method, adhesion of the skin to the repaired tendon occurs; this disadvantage has not been observed in the Stader Fixation.

In conclusion it may be stated that the writer is unaware that the above application of the Stader Splint has hitherto been described, and it is hoped that the procedure may be of value to others.

Weekly Wisdom

The clinician must feel directly responsible to his patient—not for him to somebody else.—Sir Alfred Webb-Johnson, President of the Royal College of Surgeons.

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A second impression has been printed of the helpful and widely appreciated address by Mr. R. Glave Saunders, C.B.E., M.R.C.V.S., F.Z.S., 7, Shelley Road, Exmouth, entitled "The Problem of Cruelty to Animals." Printed in *The Veterinary Record*, September 17th, 1938, the address was originally given to the Western Counties Division of the National Veterinary Medical Association at Launceston, June 15th, 1938. It was repeated in an abbreviated form to the Annual Meeting of the Exeter, East and West Devon Branch of the R.S.P.C.A. at the Guildhall, Exeter, in 1942, and to the Torquay Branch in 1943.

REPORT

Survey of Animal Husbandry, Feeding, Management and Veterinary Services in the West Indies

Trinidad and Tobago

by

Professor W. C. MILLER, M.R.C.V.S., F.R.S.E.

Professor Miller, after a short general introduction giving an outline of the places which he visited, gives a detailed survey of the livestock and veterinary services in Trinidad and Tobago.

The so-called Savannah grass (*Axonopus compressus*) and Bahama grass (*Cynodon dactylon* L) are the best type of pasture grasses, but Guinea grass (*Panicum maximum*) is also fairly common, whilst Elephant grass (*Pennisteum prupureum*) and Para grass (*Panicum barbinode*) seem to be capable of cultivation and improvement in the pastures of these Islands.

The livestock industry falls under the following categories:—

(1) Cattle maintained for milk production, meat production and for working purposes.

(2) Horses, asses and mules required for estate cultivation and haulage, riding purposes on estates, and for transport of goods and merchandise. A relatively small number of horses are maintained for breeding and racing purposes.

(3) Small stock: goats, pigs, sheep, rabbits, for production of human food.

(4) Poultry.

For convenience of discussion this livestock is classified under the headings of ownership, thus: Estates owned, Privately owned and Peasant owned.

(1) Estate-owned Livestock.—The various estates which grow sugar, coconuts and other produce maintain various animals such as horses and mules for riding purposes, mules, oxen and water buffalo for draught purposes, dairy cattle for milk production and pigs in a few cases to provide fresh meat.

(*a*) *Horses and Riding Mules.*—These are on the whole of good quality, and are used for riding round the estates and also for racing purposes. There seems no doubt that the interest in racing and the breeding of racehorses has stimulated the general breeding industry in the Colony.

(*b*) *Draught Mules, Oxen and Buffalo.*—Mules seem to do fairly well and are mainly imported from Kentucky, but the methods of management leave much to be desired in many cases. They live in "mule-pens" and the general competition for food and water and space to lie down and rest reacts unsatisfactorily on the animals.

Working oxen vary greatly but most of them are the result of varying mixtures of Zebu cattle with the native island breed. They have the usual drawbacks of working oxen, the use of which, at best, is a very slow process, and they work in a bowed neck yoke of wood, which is the usual type of gear seen in most tropical countries. Feeding is mostly upon molasses and forage crops, mainly *Panicum* and *Pennisteum*, and Professor Miller makes suggestions for improved feeding, one of which is that the fodder should be chaffed and fed in troughs. Generally feeding was very primitive and although there is now available a good deal of data following work done at the Imperial College of Tropical Agriculture, little or no use has been made of this knowledge.

There are six to seven thousand head of buffalo used for working purposes in Trinidad and Tobago. They are of the Indian water buffalo type and a good specimen will weigh 17 to 18 cwt. at four years of age. He is slower than the Zebu ox but will pull approximately twice the load. They also have the advantage of being easily kept on roughages of poor quality, and they also mature quicker than oxen.

(*c*) *Dairy Herds.*—Several estates keep herds of dairy cattle for the supply of milk to the estate hospitals and to the families and staff employed. Some of the dairies visited were exceptionally well stocked, equipped and managed, though this did not apply to them all. Most of the cows are regularly tuberculin tested and reactors removed, and in the best dairies the milk is cooled and bottled on the farm. The foundation stock was mainly the cross-bred Zebu native cow which was bred to a half-bred or even a pure bred Holstein bull. The dairy cows on the estates are mostly well fed and in good condition. 60 to 65 lb. of foreigh grasses provides most of the maintenance requirements and the addition of 1 lb. of coconut meal and 5 lb. per head per day of molasses is enough for maintenance and the first gallon of milk. For the higher yielding cows a concentrate mixture is fed at 3 to 4 lb. for every gallon of milk produced. The concentrate fed varied with local supplies, but mostly contained soya bean meal, coconut meal, linseed cake meal, and maize meal. Butterfat content on the whole averaged about 4·5 per cent. In most herds the heifer calves are reared and the bull calves used later for transport purposes. It was noticeable that those herds which are run under constant veterinary supervision are far superior to those where no such help was available, or if available, was not untilized.

The housing conditions for dairy cows varied from well planned and well built cow houses down to primitive, dirty hovels. There is room for great improvement in the feeding of the calves, and such elementary principles as the need for colostrum and the feeding of calves three or four times a day during their first weeks of life are apparently not appreciated. The milk production is generally not of high standard, but this again varies considerably and education in methods of correct milking is required in many of the herds. There are the usual complaints of irresponsibility of the employees and there is a general shortage of dairy equipment.

(*d*) *Pig Keeping.*—The pigs which are kept on a few estates were mostly Canadian Berkshires or Large Blacks. The general tendency was to feed them too slowly when young and too fast when older, with the result that the carcase is deficient in muscle and carries an excess layer of fat under the skin. This was most noticeable where feeding upon raw coconuts was practised. There is much room for improvement in methods of pig husbandry and there is no reason why the local advisory staff should not be able to bring this about.

(2) Privately Owned Livestock.—In Trinidad and Tobago there are no large privately owned ranches devoted primarily to livestock production. There are, however, both private and company owned dairies near the larger towns; these vary considerably but most are run fairly efficiently. There is, however, a lack of enterprise and there is little or no effort made to enclose the land by fencing, to create pasturage, or to raise food crops for cattle. Instead, most of the feeding-stuffs were purchased outside. Encouragement and advice might well be given to private enterprise with the smaller animals such as goats, pigs, rabbits and poultry, which could provide a valuable supply of food.

(3) Peasant-owned Livestock.—Many peasants keep a few cows behind their dwelling houses and graze them on the roadsides. The yields of milk are low, perhaps a gallon a day. Others have rather larger units of ten to twelve cows and these are often owned by East Indians.

The cows were mainly in good condition and surplus food from vegetable gardens and allotments was given to the animals. It is emphasized that a constant steady income from milk produced by peasant owners acts as a stabilizing social influence, and as an alternative to the production of a cash crop has much to recommend it.

The Sanitary Authorities in the bigger towns have a series of regulations regarding cow sheds used for milk production, but some of the regulations appeared to be unnecessarily irksome and not founded on the principles of hygiene and common sense, and it is recommended that these regulations should be reviewed and brought up to date in accordance with modern ideas.

As regards small stock, there is very little organization among the peasants, but large numbers of goats, pigs and poultry and some sheep and rabbits are kept by the peasants both in the urban and country districts. They are a valuable source of food and should be encouraged, but it appears that considerable education is necessary before anything like the best can be got out of this type of stock.

Government Stock Farms.—The Government stock farm at Valsayn, Trinidad, which has been under the charge of Captain H. V. M. Metivier, O.B.E., B.SC., M.R.C.V.S., since 1919, was visited. The stock here comprises 350 dairy cattle, 75 Zebu type cattle, 25 Sahiwals, 14 water buffaloes, 45 horses, asses and mules, along with a considerable number of goats, pigs, rabbits and poultry. The farm supplies Government institutions with milk, and milk for the school-children scheme, also improved livestock for distribution to peasant farmers, private owners and to the Governments of adjacent countries. The cows are milk recorded and period butterfat tests are made, and production takes place under modern conditions and the milk is pasteurized on the farm.

The farm distributes superior livestock which has been graded up with Holstein bulls largely of American and Canadian origin.

The General Type and Characters of Dairy Cattle in Trinidad.—It is pointed out that the type and characters of these cattle depend not only on their breeding but on the methods of feeding and management, and the general scheme is to cross a Holstein bull, varying from half bred up to pure bred, on to a native cow, and thereby increase the milk production from perhaps a gallon a day up to three and a half gallons. These cross-bred animals are much more docile than the native cows and will give their milk in the absence of the calf, which is not usual with pure native breeds. The pure bred and higher graded animals seem to be of inferior type and constitution and it appears that, to obtain a satisfactory animal for the dairy and also from the point of view of conforma-

tion, a certain amount of Zebu blood is necessary. They resist tick-borne diseases better and withstand the general climatic and environmental conditions much better than pure bred European cattle. The question of management, however, is most important.

The Government stock farm at Tobago is smaller and is run as a pig breeding establishment and has a Canadian bred Holstein-Friesian bull, some jack donkeys, and a thoroughbred stallion.

Future Development of Livestock Farms.—It has been recommended in the report of the Agricultural Policy Committee for Trinadad and Tobago, 1943, that the Government livestock farm at Valsayn should be moved to the site of the new Agricultural Station, where a greater acreage would be available and would leave the present farm site for building purposes. Professor Miller, however, points out that there are a number of very good reasons why the farm should not be transferred, because of the accessibility of the present site, the amount of development which has gone into it, and the capital value of the buildings already in existence.

Animal Husbandry.—The importance of developing in the Colony a balanced system of agriculture cannot be over-emphasized and the most urgent need amongst the peasant community is for education and advice in the application of proved principles of breeding, feeding, and management of stock, and whilst investigation and experimental trials should be carried out locally it is recommended that the major research problems should be dealt with by the proposed West Indian Animal Breeding Station, which will be an extension of the Imperial College of Tropical Agriculture.

Animal Breeding

(1) *Cattle for Milk Production.*—More than three quarter-grade Holstein-Friesian crosses with the native stock leads to deterioration in stamina and production. The predominant dairy characters of the bull, however, make the selection of family foundation stock of less importance than members of the Agricultural Policy Committee regarded as essential, and a scheme whereby an imported Holstein-Friesian bull is first crossed with good Zebu cows and their offspring put to an imported Holstein-Friesian bull is suggested as a means of producing a better dairy breed in the islands.

(2) *Buffalo Breeding.*—The labour necessary for the maintenance of a herd of buffaloes is getting difficult to recruit and this makes the question of buffaloes a somewhat complicated problem. The rapid growth rate of these animals and their potential value as a source of meat are commented on. The necessity for the importation of good young buffalo bulls from India in order to arrest the deterioration in breed type is emphasized in the Report.

(3) *Horses, Mules and Donkeys.*—Tobago is better than Trinidad for horse and mule breeding and, apart from riding horses for estates, the Police, and for racing purposes, it is contemplated that as far as the management of estates is concerned transport will be mainly mechanized in the future. A certain number of mules and donkeys will always be used by the peasants, and better management and better carts, housing and harness are recommended.

Animal Diseases and Veterinary Services

Trinidad and British Guiana act as buffer territories between the areas of heavy disease incidence in South America and the areas of less disease to the north. As some 15,000 head of cattle are imported yearly from Venezuela into Trinidad the risk of disease being introduced is very real. Tuberculosis, Brucellosis and endo- and ecto-parasites are three of the most important diseases of stock in the island, whilst paralytic rabies and equine encephalomyelitis are always a menace.

An efficient and adequate veterinary service is required and it is recommended that an organization be established composed of (1) a deputy Director of Agriculture (Veterinary Services and Animal Husbandry), (2) A Veterinary Investigation Officer of senior grade, (3) four Veterinary Officers, the senior of whom should be stationed at Tobago, (4) five Animal Husbandry Officers, and (5) the necessary technical and clerical staff.

The Veterinary Investigation Officer should be in charge of a laboratory which, owing to the well-developed air services, will be able to serve British Guiana, Barbados, Windward Islands and the Leeward Islands, all of whom would contribute towards its maintenance. The Veterinary Service should be incorporated within the unified Colonial Veterinary Service. It appeared evident that the West Indian authorities have failed to appreciate the importance of an adequate veterinary service and to these a very large measure of the backward state of animals production can be assigned.

Educational Developments.—The future prosperity of the peasant owners in the islands is based upon better educational facilities and the necessary instruction in animal husbandry and animal management is essential if development is to proceed satisfactorily. The Juvenile Farm Club scheme in Trinidad and Tabago is an excellent organization and was introduced by Dr. des Isles into Tobago some years ago. The scheme has a membership of nearly 7,000 children who own almost 11,000 animals, and has generally a very excellent method of providing the type of education which is so important to the peasants of the island; it is recommended that the Officers of the Veterinary and Animal Health Services should take a share in the organization and work of educational development along these lines in co-operation with the officers of the relevant departments.

Scholarships in Veterinary Science.—The staffing of the Veterinary Services is by officers from overseas, but it should be envisaged that local-born Trinidadians will gradually occupy the majority of these positions in accordance with British Colonial Policy. To this end it is suggested that local Governments might provide scholarships for the training of suitable local candidates in Britain or elsewhere.

J. C.

ABSTRACTS

[Reservoirs of Infection of Streptococcus agalactiae. Spencer, G. R., McCarter, J. and Beach, B. A. (1946). *Amer. J. vet. Res.* **7**. 32-36. (13 refs.).]

The authors estimated the sensitivity of a selective medium for isolating *Str. agalactiae* from heavily contaminated materials by mixing a known number of organisms with such materials. They then applied their tested method to infected premises, showing that the floor and bedding from beneath infected cows did not yield cultures of the organism. It was, however, isolated from the hands of two milkers from a hand-milked herd and absent from eight attendants in machine-milked herds. The authors also showed that the majority of *Str. agalactiae* were dead after 24 hours on bedding, a few surviving for six to nine days.

A. W. G.

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[The Pathogenicity of Penicillin-insensitive Infection. Harley, H. R. S., Baty, J. A., & Bowie, J. H. (1946.) *Brit. med. J.* No. 4451. 639-643.]

The cases recorded in this article emphasize the importance of infection of compound fracture wounds by Gram-negative organisms, such as *Bact. coli, Ps. pyocyanea* and members of the proteus group. The first six cases, recorded in detail, describe how infection of compound femoral fractures by penicillin-sensitive *Staph. aureus, Str. pyogenes* and diphtheroids was rapidly cleared up by penicillin therapy, but persistent infection by Gram-negative organisms, uncontrollable by sulphathiazole, resulted in severe and prolonged illness. In all six cases, such infection rendered it essential for the affected limbs to be amputated, in order to save the lives of the patients. In each case, Gram-negative organisms were isolated from the pus on many occasions. Pyogenic cocci, when present, occurred as evanescent hospital infections, and were rapidly controlled by penicillin therapy.

In addition, there were cases of infection by strains of *Staph. aureus* which were naturally resistant to penicillin, or had become tolerant to it. Such cases became more numerous some months after the institution of penicillin therapy. These strains were found in war wounds in any part of the body, but proved most troublesome in compound femoral fractures.

In one interesting case there was a wound infection by a strain of *Staph. aureus* which was 16 times more resistant to penicillin than the Oxford staphylococcus. Normal penicillin treatment did not prevent rapid deterioration of the patient's condition, but a 16-fold increase in dosage resulted in a striking improvement in condition, and probably saved the man's life.

Summing up, the authors state that the Gram-negative bacilli are a common cause of low-grade infection in bone, following compound fractures in the East, and are capable of producing severe spreading infection.

[*Abstractor's Note.*—Similar cases are encountered in cattle surgery, *e.g.*, in amputation of the digit, in which infection of the operation wound by *C. pyogenes* and the pyogenic staphylococci and streptococci can be cleared up by penicillin therapy, but the wounds fail to heal owing to persistent infection by *Bact. coli* or *Proteus vulgaris.*]

I. W. J.

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[On the Employment of Brilliant Green and Gentian Violet, Combined, in the treatment of Gastro-intestinal Strongylosis of Sheep. (Trans. title.) Salomon, L., & Salomon, Leone. (1946). *Bull. Acad. Vét.* **19**. (3.) 93-96.]

Each of four ewes, weighing 40 to 45 kilogrammes and infested with trichostrongyles, were given four capsules of brilliant green and gentian violet per day for eight days. The course of treatment was repeated twice, each time after an interval of one week. The capsules, composed of calcium phosphate and carbonate, contained 0·03 gr. (? gm.) of each dye. No toxic effects were observed and even a single course at double this dosage was well tolerated.

(*Continued at foot of col.* 1, *page* 492)

REVIEW

[Penicillin, its Practical Application. General Editor: Professor Sir Alexander Fleming. 1946. Butterworth & Co., London, 30s.]

It is a remarkable testimony to the therapeutic value of penicillin that sufficient knowledge should have accumulated in a comparatively short space of time to merit the publication of a book on the subject. It was only in 1938 that the Oxford group of workers demonstrated the therapeutic value of penicillin in mice, although its antibiotic effect had been demonstrated ten years previously by Sir Alexander Fleming.

This book, which is edited by Fleming, is not a continuous textbook but a series of independent contributions by 27 authors, and for this reason there is inevitably a certain amount of repetition in the data presented. It covers the whole field of its subject from chemistry, manufacture, pharmacy and pharmacology to every form of clinical application. As one turns the pages of the book, one is indeed amazed to find that the drug is effective in so many conditions; its success is primarily due to the fact that so many disease conditions in the human subject are caused by pathogenic organisms susceptible to its action.

The single chapter devoted to the subject and ably compiled by Dr. Lovell shows, however, that the drug has as yet received only a limited trial in veterinary medicine. This is rightly pointed out to be due to the fact that the drug has been until recently in short supply and therefore had not then been released in this country for general veterinary use. Apart from its recognized value in mastitis due to *Str. agalactiae* and limited value in other affections of the udder, there are indications of its successful application in the treatment of strangles, cystitis, pyelonephritis and swine erysipelas.

Practically the whole of the text is concerned with the treatment of affections encountered in man, but this should not deter the veterinarian from a study of the book, since it ought to provide him with instructive information on the ways of using penicillin, particularly in the selection of dosage and also in providing information on the success that may be anticipated in the treatment of similar conditions in animals.

The scope of penicillin therapy in its application to human medicine is so wide that it embraces such diverse and specialized spheres as ophthalmology, major chest surgery, venereal disease, and plastic surgery. Already the obstetrician, the dermatologist and the orthopaedic surgeon have had the opportunity of discovering the value of penicillin in facilitating their work, and no doubt, as supplies are made available to the veterinary profession, so will the drug also prove of value in the treatment of disease conditions affecting animals.

FRIESIAN COW MAKES MILK RECORD IN FIJI

A record milk yield for a cow in Fiji, owned by the Fiji Pastoral Company, has just been reported in the following terms, states the *Colonial Office News Service*: "In the latter part of 1932 there was born at Navua a grade Friesian heifer calf. She had no pedigree and there was nothing to distinguish her from the other heifer calves in the herd. She was not even given a name, but was allotted the herd number '295.'

"On October 12th, 1934, when she was about two years old, No. 295 delivered her first calf and 'came into profit.' Thereafter she had a calf every year until January 14th, 1942, when her ninth and last calf was born. Up to January 14th, 1942, she had been milked for a total of 2,129 days, or an average of 266 days in each calendar year.

"Since January 14th, 1942, No. 295 has borne no more calves, but has continued to be milked every day of the year. That means that she has, at the end of August, 1946, been continuously in milk for 1,690 days and has, since the beginning of her first lactation, been milked for a total of 3,819 days. Now, at the age of 15 years, she is still in milk but is showing signs of old age.

"During her lifetime, and up to the end of August, 1946, cow No. 295 has produced, according to individual records kept, just under 30 tons of milk, from which has been separated enough cream to manufacture approximately 24 cwt., or 48 cases, of butter."

Chemically pure drugs were used to avoid any poisoning by impurities (lead and tin). No changes in diet were made and no purgative was necessary. Faecal examinations during and after treatment showed a marked reduction in the number of worm eggs (genera and species not indicated). The dyes do not stain the musculature, but one disadvantage is the necessity for repeated dosing over a long period. Further work, however, may produce modifications in administration. It is suggested that these dyes may be found to have a useful action against the parasites of other domestic animals.

M. L. B.

IN PARLIAMENT

Feeding-stuffs (Rationing)

In the House of Commons on Wednesday of last weeek Mr. DAVID ECCLES moved that the Order, dated September 5th, 1946, amending the Feeding-stuffs (Rationing) Order, 1943, and thereby enabling the Minister to cut the rations of balancer meal to certain classes of pig and poultry keepers, be annulled.

Speaking to his motion, Mr. Eccles said that the cuts were announced on June 4th, nearly four months ago. Even if the cuts were justified on June 4th by the then supply position of feeding-stuffs, even if it was wise then to make provision that, on October 1st, certain reductions in the ration should be made, he thought he could show the House that there was no justification for such reductions now. This was not a party matter; it was simply a matter of trying to find the truth about the facts and figures of the feeding-stuffs position, and then asking the House to decide whether the Minister's proposals, as contained in this Order, were sound or not.

The Order applied to 143,000 pig keepers who belonged to nearly 5,000 pig clubs, to 1,500,000 domestic poultry keepers, and to 21,000 small commercial poultry keepers. The decision of the House would therefore affect 1,700,000 livestock keepers, and of course a very large additional number of consumers of eggs and pig meat.

The rations of the pig keepers were to be cut from the present maximum of .126 lb. if two pigs are kept to a maximum of 42 lb. a month however many pigs are kept. The rations of the domestic poultry keepers—the 1,500,000 people—were to be cut 60 per cent., from 5 lb. to 2 lb., and this was the first time that the ration of the domestic poultry keeper had ever been cut. The ration to the commercial poultry keeper was to be cut 20 per cent.

How much was being saved by these cuts? In round figures, the cut in the pig ration would save 40,000 tons, and the cut in the poultry ration 60,000 tons. Therefore, the total saving was 100,000 tons. What was it exactly that was being saved? It was balancer meal, and, as the name implied, this meal was required to balance kitchen waste, which was not a satisfactory food for pigs and poultry without the addition of this meal. Therefore, for every pound that the Minister took off the ration of balancer meal, the effect was multiplied by the loss in the production value of the kitchen waste that would have been mixed with it. To put it in another way, the Minister could do nothing more expensive in terms of egg and pig meat production than to cut this particular ration to these particular classes of egg and pig meat producers.

In the Debate on June 18th the Minister of Agriculture defended these cuts on two grounds. In general terms, he said that circumstances outside his control—the great world food shortage—made it absolutely necessary to effect this saving in the consumption of feeding-stuffs. The Minister also said that the domestic poultry keepers, these 1,500,000 people, could take the cut because they were now keeping two hens for every one which it had been intended that the ration should support. In other words, the Minister was saying that these poultry keepers had done a very efficient job, had doubled their target, and therefore could now take a cut. We should give these people a fair award for pushing on so hard with their production in the war.

From the Report of the Sub-committee of the Economic and Social Council on the Reconstruction of the Devastated Areas, issued on September 12th, they could see how the livestock population of the countries across the Channel was steadily increasing. We could see that the pig population of Holland, Belgium and France was, in 1944, a larger proportion of their pre-war pig population than ours was in 1944. From that level they had steadily increased their pig population to the present time.

They could also see, in regard to poultry, that between May, 1945, and May, 1946, poultry keepers had doubled their poultry. It was obvious how it had been done. They had fed to livestock, grain which they had imported, chiefly maize, from the Argentine, nominally for human consumption. Our Government had been made an honest fool. We had stood out of the Argentine maize market, because we said the maize was not wanted here for human consumption. These other countries had bought the maize and fed it to their livestock. It was clear from the Report that there was no other explanation for the growing stocks of birds and pigs across the water. The Governments of Denmark, Holland and France had helped themselves and their agriculture, whereas our Government had done little or nothing to ensure an adequate supply of feeding-stuffs.

Two great things had happened which, in his judgment, made the present cuts unnecessary. First, on September 22nd last, the extraction rate of flour was reduced from 90 to 85 per cent. That had given to the Minister an additional supply of home-produced feeding-stuffs at the rate of 300,000 tons a year. The Minister

did not know that in June. Why had he not given any of these 300,000 additional tons to the domestic pig and poultry keepers? They wanted to know where the 300,000 tons, which had been produced by increasing the extraction rate of flour, was now going.

Secondly, we had had a bad harvest and one of the results of a bad harvest was to increase the proportion of unmillable grain. The best estimate he could get from the grain trade was that our harvest this year would be nearly two million tons, and that the damaged grain, which was not millable, would yield at least 10 per cent. That meant that farmers would have 200,000 tons of feeding-stuffs from that source, which was more than they normally had. If farmers were to have this addition to their ration from unexpected sources, was it not all the more scandalous that none of the 300,000 tons coming from the flour mills was to be given to the small pig and poultry keepers?

Mr. Hurd, seconding the Motion, said that the Minister of Food was saving 20 per cent. on flour; he was getting it by making it impossible to feed flour and oatmeal to hens and pigs. If he could have provided sufficient feeding-stuffs for the small poultry flocks, we need never have had his bread rationing scheme. The only good thing that had come out of bread rationing was that it had stopped the illicit feeding of flour and oatmeal to poultry. So a steamroller was used to crack a nut.

Could we not have done as well as other countries in looking after our pigs and poultry? Mention had been made of Belgium, Denmark and Holland, and, he would also add, Sweden. He had the pleasure of visiting Sweden in company with the Minister of Agriculture at Whitsun, and at one farm saw flaked maize in the pig trough. He enquired further, and as far as he could find out, Swedish farmers had insisted, through their Government, that feeding-stuffs should be made available for pigs and poultry. Their Government took a commonsense line, and used every possible endeavour to get it, and, in fact, did get it. When, in September, we managed to scrounge a little more feeding-stuffs, he understood that it came out of some country's allocation which had not been taken up. That was a desperate position for Britain to be in. It looked to him as if we were taking merely the leavings of other countries' trade. Could not we go out and buy, as Denmark, Sweden, Holland and other countries were doing? He was sure that we could.

Mr. Wilfrid Roberts expressed regret that neither the Minister of Food nor the Minister of Agriculture was present, because this was a matter which affected a very large number of people. There were about 1,300,000 domestic poultry keepers, which was a very large number of householders. This Order affected them both as poultry keepers and as egg consumers. It was a question about which very many people felt very keenly. The number of domestic poultry involved was about 11 million out of a total number of poultry, given in the statistics of the Ministry of Agriculture, of about 36 million in this country. It was also a part of the whole problem of imported feeding-stuffs, which affected the farming community and the whole of the consuming public. It affected the more specialized poultry industry, the small poultry farmers who were, of all classes in the agricultural community, those who had been worst hit during the war. They had had a most difficult time. He hoped that the Ministry would be able to make some concession: he could not believe that the relatively small quantity of feeding-stuffs involved could not be found. He had hoped that between June and now the better prospects in many parts of the world would have made it possible for the Ministry of Food to find available feeding-stuffs. The cut was a heavy one—and the result would be that chickens would be underfed and starved, and would not produce eggs, and what feeding-stuffs there were would be badly used.

He was told that if the Minister of Food could manage to purchase 10 per cent. of the American maize crop that would solve this problem and go far towards solving many other feeding-stuff problems. What was happening to the foodstuffs which would now be at our disposal as the result of making available a larger proportion of millers' offals? He recognized that other livestock, particularly dairy cows, had a very considerable claim, but he also thought that these poultry keepers had a considerable claim, too.

Mr. Collins: It had been said that if the Minister of Agriculture had waited until October, he would have known that we had had bad harvests and that there was a large quantity of unmillable corn, and that there had been good harvests in America; and he could have maintained the ration. He suggested that if the Minister had been so utterly improvident as to wait another three or four months, and if things had not turned out in that way, he would most definitely have been fooling about in a heartless way with the poultry industry. It would have been utterly wrong to leave matters until the autumn and then to make an announcement because the cuts had become unavoidable. Until the Minister of Food felt that those rations could be increased, it would be completely wrong and entirely against the interests of poultry keepers to suggest or encourage the belief that the rations could be immediately increased.

Mr. Gerald Williams: We should make shipping space available as a first priority in order to keep up our poultry stocks in this country. He asked the Parliamentary Secretary to realize the consequences which would follow this new Order. One of three things would happen. The poultry keeper would have to kill off many of his birds as time went on. That was destroying capital, valuable capital, and that would have a very drastic effect on the future of this country as a whole, let alone the poultry keepers. The second alternative was that the poultry keeper would have to feed his fowls on "bits and pieces": this was entirely uneconomic.

Dr. Edith Summerskill, Parliamentary Secretary, Ministry of Food, said that if world conditions improved it would be possible to reduce the extraction rate of wheat and so have more millers' offals, but next year there were going to be food shortages throughout the world. The Government deplored the cuts, but they put human beings before pigs and poultry.

Mr. R. S Hudson said that the cuts in question were totally unnecessary. He understood that 200,000 tons of unmillable wheat were lying about, rapidly deteriorating, on farms in this country. If the Ministry of Food would get it, some fraction of the cut could be made good.

The closure was carried by 207 votes to 75—Government majority, 132, and the motion was negatived by 208 votes to 74—Government majority, 134.

Questions

Tuberculosis (B.C.G. Vaccine)

Dr. Segal asked the Minister of Health to what extent supplies of B.C.G. vaccine for tuberculosis are now available in this country; and how they may be obtained.

Mr. Bevan: B.C.G., which is used in various countries for the prevention, not the treatment, of tuberculosis, is not at present available here. Steps are being taken, however, with a view to securing its manufacture in this country.

Dr. Segal: Is it not time the Minister appointed a commission of enquiry into the relative merits of this and other vaccines for the prevention of tuberculosis among contacts?

Mr. Bevan: As the hon. Gentleman knows, the situation in this field fortunately changes almost from week to week, and it is indeed doubtful whether a commission of enquiry would be in a sufficiently static position to make its recommendations of any value.

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Scientific Research (Co-ordination)

Mr. Callaghan asked the Lord President of the Council on what basis Government Departments and the Services carry out scientific research; and to what extent and by whom are research programmes co-ordinated.

Mr. H. Morrison: I would refer my hon. Friend to the White Paper on Scientific Research and Development (Cmd. 6514) published in April, 1944. The central machinery for co-ordination in the civil science field is at present under review. Revised arrangements for defence research are described in the White Paper on the Central Organization for Defence (Cmd. 6923).

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Colonial Service Recruitment

Mr. Rees-Williams asked the Secretary of State for the Colonies how many applicants have been accepted for the Colonial Service during the last 16 months; what proportion of these were drawn from the Colonial peoples; what proportion from the Dominions; what is their educational background; and what deficiency in staff remains.

Mr. Creech Jones: The following figures (which do not cover recruitment for subordinate technical and other posts, statistics of which are not available because the great majority of such posts are filled by Colonial Governments from Colonial people, and the Crown Agents for the Colonies fill posts where no qualified candidates are available locally) show the results of recruitment by the Colonial Office and its agencies in the Dominions for the higher grades of the Colonial Service:

Total Applicants accepted	2,335
Colonial peoples: about 2½ per cent. of this total, in addition to a certain number with Colonial affinities who have presented themselves as United Kingdom candidates.	
Drawn from Dominions	about 6 per cent.
Educational background:	
(*a*) *Schools*:	
Public Elementary and State aided secondary	about 46 per cent.
Private Preparatory and Public Schools ...	about 35 per cent.
Overseas	about 12 per cent.
Mixtures and indeterminate	about 7 per cent.
(*b*) *Universities*:	
Oxford and Cambridge	about 19 per cent.
Other English and Welsh Universities ...	about 29 per cent.
Scots Universities	about 10 per cent.

Overseas Universities	about 8 per cent.
No University	about 34 per cent.

Present deficiencies:

Engineers	200
Agriculturalists, Veterinarians, Geologists, etc.	150
Doctors	100
Teachers	80

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Foot-and-Mouth Disease

Mr. J. Morrison asked the Minister of Agriculture whether the fact that South American meat and pork is a source of foot-and-mouth disease has been brought to his notice; and what steps he proposes to take to prevent infection from this source.

Mr. T. Williams: Yes, Sir. It has long been realized that meat brought from countries where foot-and-mouth disease is endemic might be the means of introducing that disease into this country. All practicable protective measures against the introduction of infection are taken, and have been taken for several years, both in South America and in this country.

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Tuberculin-Tested Milk

Mr. Somerville Hastings asked the Minister of Food in how many areas he has made use of the power vested in him by Defence Regulation No. 55G and ordered that only tuberculin-tested, accredited or pasteurised milk should be sold by retail in that area.

The Parliamentary Secretary to the Ministry of Food (Dr. Edith Summerskill): I would refer my hon. Friend to the statement made in another place on July 31st last, a copy of which I am sending him. Restrictions on the classes of milk sold will not be imposed in any area until Defence Regulation 55G has been replaced by new legislation.

Mr. Hastings: May I ask my hon. Friend whether this reply means that she is satisfied that the milk is safe in every part of the country?

Dr. Summerskill: I think my hon. Friend has known me a sufficiently long time to know that I am not satisfied—indeed, I am dissatisfied. In view of that, we have set up a committee fairly recently in order that it shall recommend along what lines we shall promote legislation.

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Advisory Service (Appointments)

Mr. Price-White asked the Minister of Agriculture the number of persons appointed to posts in the recently established Agricultural Advisory Service and, of those, the number who are graded at a lower salary in that service than they were previously paid by agricultural departments of university colleges and other institutions by which they were employed, prior to their transfer to the Agricultural Advisory Service.

Mr. T. Williams: The number of appointments made up to date is 1,016. No officer who had statutory right of transfer as defined by Section 1 (2) of the Agriculture (Miscellaneous Provisions) Act, 1944, has been appointed at a lower salary than he was receiving at the date of transfer.

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Streptomycin

Mrs. Mann asked the Minister of Health whether his attention has been drawn to the claims made for streptomycin as a cure for tuberculosis; whether medical science supports the claim; and whether streptomycin is available to patients in our institutions.

Mr. Bevan: I am aware that medical research is being undertaken in the United States of America regarding the value of streptomycin in the treatment of tuberculosis. It would not be justifiable to adopt it for general use in this country until adequate clinical trials have been carried out to test such claims as are made for it, and arrangements to this end are being made.

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Carcase Meat (Denmark)

Mr. Hurd asked the Minister of Food how much fresh meat is being imported from Denmark and other continental countries; and what measures are being taken to prevent the introduction of foot-and-mouth disease.

Mr. Strachey: We expect to get 10,000 tons of carcase meat from Denmark within the next few months and additional quantities are in prospect for subsequent delivery. No imports from other continental countries are contemplated. We are in consultation with the Ministry of Agriculture and Fisheries and with the veterinary authorities in Denmark over the necessary precautions. The hon. Member may rest assured that they will not be neglected.

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Animal Feeding-stuffs

Lieut.-Colonel Bromley-Davenport asked the Minister of Food if he is aware of the shortage of condemned cow beef and horseflesh available for dog food in the Cheshire area; to what extent that shortage is due to the diversion of such flesh to fertilizer factories; and if he will take any action in the matter.

Mr. Strachey: There is a general shortage of meat for feeding to dogs, but I have no reason to suppose that it is any worse in Cheshire than elsewhere. The bulk of the condemned meat from livestock slaughtered on behalf of my Department is used for the production of protein animal feeding-stuffs, tallows, fertilizers, etc., which are urgently required, and I am not prepared to divert supplies of such meat to dog feeding. I have no information regarding horseflesh and other meat from knackers' yards, the disposal of which is not controlled.

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Animal Experiments (Conviction)

Mrs. Manning asked the Secretary of State for the Home Department whether his attention has been called to the dismissal of the appeal by a professor of physiology, Dr. E. G. T. Liddell, against his conviction for causing unnecessary suffering to cats at Oxford University; and whether he will consider withdrawing his certificate to experiment.

Mr. Ede: Dr. Liddell has not been guilty of any offence or irregularity in the performance of experiments, and after reviewing all the circumstances I have come to the conclusion that I should not be justified in withdrawing his licence. It is, however, essential that proper care shall be taken of animals kept on laboratory premises, and I am taking up with the appropriate authorities the question of improved arrangements for supervising the care of animals at the laboratory in question.

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Greyhound Racing Tracks (Dogs)

Mr. Peter Freeman asked the Secretary of State for the Home Department whether officers of animal welfare societies are freely allowed at all times to inspect the conditions and treatment of dogs used at dog-racing tracks; and whether members of the police force make unannounced inspections of the dogs.

Mr. Ede: Greyhound racing tracks are private premises. I understand that visits are paid to tracks by inspectors of the R.S.P.C.A. by arrangement with the proprietors. It is no part of the normal duties of the police to make inspections of the dogs.

NOTES AND NEWS

Diary of Events

Nov. 9th.—**Annual Meeting of the Society of Women Veterinary Surgeons, at the Holborn Restaurant, High Holborn, W.C.2, 11.15 a.m. As indicated in our Notices Column, luncheon in the Restaurant will be followed by an X-ray talk and demonstration by Mr. Gordon C. Knight, at the Royal Veterinary College.**

Nov. 12th.—Scientific Meeting of the Zoological Society of London, Regent's Park, N.W., 5 p.m.

Nov. 13th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.

Nov. 13th.—Meeting of Association of Veterinary Teachers and Research Workers (Founder Members, Northern Region) at Liverpool (44, Bedford Street North), 2.30 p.m.

Nov. 22nd.—Meeting of the Veterinary State Medicine Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 11.15 a.m.

Nov. 22nd.—Scientific Meeting of the Institute for the Study of Animal Behaviour, Regent's Park, N.W.8, 4 p.m.

Nov. 22nd.—Meeting of the Sussex Division, N.V.M.A., at Brighton (The Old Ship Hotel), 2.30 p.m.

Nov. 22nd.—Annual Meeting of the North Wales Division, N.V.M.A., at Llangollen (Royal Hotel), 2 p.m.

Nov. 29th.—Meeting of the Royal Counties Division, N.V.M.A., at Reading (Caversham Bridge Hotel), 2.30 p.m.

Dec. 3rd and 4th.—R.C.V.S. Written Examinations begin.

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New Appointments to the Staff of the Ministry of Agriculture

As notified in recent issues, Council, N.V.M.A., has decided that no advertisements for appointments to the veterinary staff of the Animal Health Division of the Ministry of Agriculture shall be accepted for *The Veterinary Record* pending the settlement, in a manner satisfactory to the Association, of the question of the status and salaries of the Veterinary Officers of the Division.

In the meantime, any members of the profession who may,

nevertheless, contemplate applying for such posts, should these be advertised elsewhere, are requested first to communicate with the General Secretary of the Association at 36, Gordon Square, London, W.C.1.

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The Carriage of Dog Carcases by Rail

The attention of the N.V.M.A. has recently been drawn to a ruling of the Railway Clearing House that the carcases of dead dogs will no longer be accepted for transit by passenger train, unless they are enclosed in a strong sealed case. Enquiries made by the Association make it clear that the Railway Clearing House is acting within its rights in making this decision, which they base on the fact that passenger trains have to carry a wide assortment of commodities including live dogs, which must be protected from contamination by carcases.

Although the instruction concerning the carriage of dead dogs has, apparently, been in existence for about a year, it is evident that officials at railway stations not yet fully conversant with the amended regulation continue to accept "improperly packed" dog carcases for transit. As the instruction becomes better known, refusal to accept carcases may become more common.

The purpose of this note is to warn practitioners of the position and to advise them, when they have dog carcases for transportation, to pack them in accordance with the above regulation before they present them for transit.

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PERSONAL

Preston's New Veterinary Officer

On October 28th, Preston Health Committee decided to recommend the appointment, as the Borough's Chief Veterinary Officer, of Mr. Francis John Proctor, B.Sc. (Edin.), M.R.C.V.S., D.V.S.M., who is at present in private practice at Keswick. Mr. Proctor succeeds Major Richard Finch, M.C., T.D., F.R.C.V.S., D.V.S.M., who is retiring on pension after occupying the post for over 20 years.

Mr. Proctor will take up his post early in December; the work includes the supervision of the livestock market, the public health side of the abattoirs, and the visiting of farms in the Preston district.

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Appointments.—The Colonial Office announces the appointment in the Colonial Veterinary Service of Major D. P. Lake, M.R.C.V.S., as Veterinary Officer, Tanganyika, and of Capt. R. H. Robertson, M.R.C.V.S., as Veterinary Surgeon, Hong Kong. Mr. H. M. Stuckbery, M.R.C.V.S., Veterinary Officer, Tanganyika, is appointed Senior Veterinary Officer, Tanganyika.

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R.C.V.S. OBITUARY

Bell, John, F.R.C.V.S., Capt. R.A.V.C. (T.F.) (rtd), 3, Honley Road, Catford, S.E.6. Graduated Edinburgh, December 17th, 1889; Fellowship May 10th, 1902. Died October 30th, 1946; aged 79 years

Ironside, William James, The Old Rectory, Hoton, nr. Loughborough, Leics., Veterinary Investigation Officer, Midland Agricultural College, Sutton Bonington, Loughborough. Graduated Edinburgh, July 20th, 1923. Died October 25th, 1946.

Marriott, Thomas James, "Sunnyside," Car Colston, Notts. Graduated London, April 4th, 1876. Died October 23rd, 1946; aged 90 years.

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Death of Mr. William Jas. Ironside, M.R.C.V.S., M.P.S.

We record with deep sorrow the sudden passing of Mr. W. J. Ironside at his home The Old Rectory, Hoton, nr. Loughborough, on Friday, October 25th, from coronary thrombosis.

As Veterinary Investigation Officer attached to the Midland Agricultural College, Sutton Bonington, his varied talents were ever at the disposal of all who sought his help.

Mr. Ironside was Secretary of the Derbyshire Association from 1934 until 1940 and remained its stalwart to the last, while he was an assiduous worker for the National Veterinary Medical Association, which benefited greatly from his pharmaceutical knowledge and experience.

Mr. Ironside was a member of the Pharmaceutical Society of Great Britain prior to his entering the "Dick" College and it is possible that this early interest contributed to his outstanding success as an examiner in Pharmacology and Therapeutics for the Royal College.

We extend our deep sympathy to Mrs. Ironside, Sheila, Joan and James, and hope to pay fuller tribute in a later issue.

Mr. T. J. Marriott, M.R.C.V.S.

In the passing of Mr. Thomas J. Marriott, after an illness of two months, we mourn the loss of a remarkable veteran member of the profession. When he entered upon his 91st year, in February, Mr. Marriott was still regularly engaged in practice and driving his car to cases.

He was one of three brothers who all qualified as veterinary surgeons. One practised at Cotgrave, and the others went out to Canada. They were the sons of the late Mr. William Marriott, who, as a member of the same profession, was well known over a wide area in the country.

In his earlier days Mr. T. J. Marriott resided at Hawksworth and then Bottesford. He was veterinary inspector for Leicester County Council before taking over the practice at Car Colston in 1899. In the last few years he had restrict his activities, because of his age, but he was out attending to a case the day before his death. His wife predeceased him in 1942, and he is survived by two sons and five daughters.

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James Napier Reynard, M.R.C.V.S.

An Appreciation

In connection with the death of Mr. J. N. Reynard, recorded in our last issue, "A. C. F." writes:—

"There passed away on October 19th one of the lesser known members of the profession, James N. Reynard, of Manuel House, Linlithgow.

"After qualifying in 1914, 'James' assisted his uncle in Perth for a period. Thereafter he took to farming on the family estate at Manuel, near Linlithgow. His interests were largely in Clydesdales and Shorthorns, and for years he was a prominent breeder, particularly of Shorthorns.

"But he will be best remembered by those of us whose good fortune it was to count him a friend, as a gentleman in every sense of the term. Kindly, generous and homely, always prepared to help if such help lay within his power, he will be a much missed man in the parish of Muiravonside and far beyond."

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UNIVERSITY OF EDINBURGH DEGREE IN VETERINARY SCIENCE

At a Graduation Ceremony on Saturday, October 26th, 1946, the following students of the Royal (Dick) Veterinary College had the Degree of B.Sc. in Veterinary Science conferred by the University of Edinburgh: George Myles Gray, William Johnston Jordan, Patrick Simpson Lambert, John Lionel Ransome Leach, Malcolm William MacLean, Donald Brian Mather, Gordon Ramsay Scott, George Henry Herbert Towse and James Brian Wilson.

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MINISTRY OF AGRICULTURE POSTGRADUATE SCHOLARSHIP AWARDS

The Ministry of Agriculture has awarded the following postgraduate research and training scholarships in Agricultural Economics, Agricultural Engineering and Husbandry, tenable for periods up to three years, commencing on October 1st, 1946, or later, in the first instance at the institutions shown:—

Agricultural Economics.—A. W. Ashby—School of Agriculture, Cambridge; R. D. Hewlett—Department of Agriculture and Horticulture, Reading University; O. T. W. Price—Not yet determined; Miss M. A. Wilson—School of Rural Economy, Oxford.

Agricultural Engineering.—J. A. Gibb—Not yet determined.

Husbandry.—G. E. Barnsley—Norfolk Agricultural Station, Sprowston; A. Mitchell—School of Agriculture, Cambridge; D. E. Tribe—Rowett Research Institute, Aberdeen.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Swine Fever:

Derbyshire.—Mitchell Fields Farm, Hathersage, Sheffield, Yorks. (Oct. 29th); Kinder, Hayfield, Stockport, Cheshire (Nov. 1st); Upper Booth Farm, Edale, Sheffield, Yorks. (Nov. 1st).

Lincs. (*Lindsey*).—Crowcroft Lane, Huttoft, Alford, Lincs. (Oct. 30th).

Middlesex.—Burton Hole Farm, Burton Hole Lane, Mill Hill, London, N.W.7 (Nov. 1st).

Sheep Scab:

Derbyshire.—Upper Fold Farm, Chapel-en-le-Frith, Stockport, Cheshire (Nov. 1st).

Westmorland.—Carhullan, Heltondale, and Hullock Howe, Heltondale, Penrith, Cumberland (Oct. 28th).

LEGAL NOTES

£3,341 Damages in Cattle Case

SEQUEL TO INOCULATION AGAINST SUMMER MASTITIS

Two farmers who claimed that 60 of their cattle became ill after an inoculation against summer mastitis in July, 1945, were awarded £3,341 18s. 6d. at Chester Assizes on Monday last.

The farmers, Robert Norman Dodd and his brother, Frank Leslie Dodd, farming in partnership at Buerton Hall Farm, and Lightwood Green Farm, Audlem, Cheshire, had claimed £3,856 damages for breach of contract from Messrs. Wilson and McWilliam, veterinary surgeons of Barker Street, Nantwich, who had joined Willington Medicals Ltd., of Shrewsbury, the suppliers, and Phylax Serum Laboratories Ltd., of Radlett, Herts, the manufacturers, as third and fourth parties respectively.

Mr. Justice Hallett gave judgment for the farmers for £3,341 18s. 6d., with costs against the veterinary surgeons. He also gave judgment, with costs, for the surgeons against Willington Medicals Ltd., and judgment, with costs, for Willington Medicals Ltd., against Phylax Serum Laboratories Ltd.,

Further reference to this important case will be made in an early issue.

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CATTLE POISONING ENQUIRIES: SCOTTISH GRAZINGS NOW SAFE

In a statement issued by the Department of Agriculture for Scotland it is indicated that grazings can now be used and crops disposed of in the normal way in the Kippen-Thornhill area of Stirlingshire and Perthshire where livestock poisoning cases occurred following the disposal of smoke bombs and poison gas containers by burning in fields at the dumps in which they were stored during the war in the hills between Kippen and Fintry. Claims from farmers for loss of stock are being considered by the Claims Commission of the War Office.

Veterinary advice has been available from Professor Boddie, Royal (Dick) Veterinary College, Ministry of Agriculture officials, and the local veterinary practitioners, and all were agreed that it was preferable under the circumstances to dispose of the majority of the stock on affected farms by slaughter. On some farms all the cattle and sheep are being disposed of, while on others, particularly on some sheep farms, selected breeding stock which is still apparently healthy is being retained.

Animals obviously affected and in poor condition have been disposed of through knackeries and healthy animals through slaughterhouses. From the time salvage commenced up to October 18th, 1946, 1,527 cattle and 4,121 sheep have been sent to slaughterhouses and 134 cattle and eight sheep to knackeries. Slaughter and salvage will be completed in the course of the next week or two.

After a careful examination of all this evidence, representatives of the interested departments are satisfied that there are no grounds whatsoever for assuming that the grazings or crops are dangerous in any way. All the farmers concerned have been informed accordingly that the grazings can be used, and crops disposed of, in the normal way.

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MINISTRY OF AGRICULTURE NEWS SERVICE

Improvement of Hill and Marginal Farms.—Captain A. R. McDougal, Lammermuir, Berwickshire, has had 46 years' experience in farming 3,000 acres of hill grazing land at altitudes from 1,000 to 1,500 feet and 1,000 acres of poor stony arable land, much of it on boulder clay and all between 750 and 1,200 feet above sea level.

In a paper read to the Farmers' Club, London, on October 7th, Captain McDougal outlined the methods of improvements he had applied on hill and marginal farms. He divided the subject into two classes. First, hill grazings of heather and grass which have never been ploughed and are incapable of being ploughed. Second, marginal old arable lands ploughed in the past and perhaps ploughed now, but which were lying in bad grass.

For hill grazings the main improvements were, heather burning, shelter in the form of tree clumps, drainage, bracken eradication, proper grazing, liming and manuring.

For old pastures and marginal lands, a good sward that will lie for many years and one that will improve the soil can be obtained by deep ploughing the old pasture; cropping it and eating off as much as possible on the field, taking at least two green crops; manuring with not less than 12 cwt. high grade slag per crop; liming as required, preferably with one ton per acre of ground limestone sown with the grass seed; sorting out the drains and cutting down the ryegrass and sowing plenty of cocksfoot, fescues and timothy with wild white clover.

Having obtained good grass, treat it decently. If possible rest it from grazing for two months in early spring and do not over-graze it in early summer.

Captain McDougal said that such methods in his district, the Scotch Borders, had converted hundreds of acres of useless Bent grass and Yorkshire Fog into first-class pastures and he thought that similar methods could transform the tens of thousands of poor permanent grass in England into good temporary pasture of ten years or more.

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HUNTERS' IMPROVEMENT SOCIETY

At a recent meeting of the Hunters' Improvement and National Light Horse Breeding Society, the Secretary pointed out that there was still a large number of members in arrear with their subscriptions. It was decided that entry fees to the Hunter Stud Book be "four times greater" for non-members than for those payable by members of the Society. The average number of mares served by the Society's Premium Stallions in 1946 was 55. The best were Jean's Dream travelling Worcestershire, 117 mares, and Trappeur 2nd, travelling in Devon, 102 mares.

For next season, it is hoped, if funds are available, to offer approximately 54 Premiums of £200 each to thoroughbred stallions to travel prescribed routes throughout England, Scotland and Wales. In addition the following Super Premiums are likely to be awarded to stallions 16 years of age and under, if of sufficient merit—six Super Premiums of an additional £100 each, and six Super Premiums of an additional £50 each. The Champion stallion and reserve Champion stallion would be awarded Super Premiums irrespective of their ages. Next year, also, the Society will reserve to itself the right to withhold payment of the second part of the Premium from any horse which has not served 30 mares, any such case being fully enquired into by the Society.

It has been decided to hold a Stallion Show in March, 1947, and a Sub-committee was appointed to inspect and select a suitable place. Colonel C. Spence-Colby, C.M.G., D.S.O., of Ledbury, Herefordshire, was unanimously elected vice-president of the Society (*i.e.*, president in 1947).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

Notice to Correspondents

The Editorial Committee regrets that, the paper supply situation having deteriorated, it has become necessary to ask correspondents again to accept a limitation on the length of letters submitted for publication. Accordingly, contributors to our Correspondence Columns are requested to note that, until further intimation is made, their communications must not exceed 350 words.

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SALARIES IN PUBLIC VETERINARY APPOINTMENTS

Sir,—In regard to the desirability of increasing existing salaries of veterinary surgeons holding public appointments, a recent article in the *Manchester Guardian* compares the average salary of £7 2s. per week received by a police constable with that of a tradesman, which is considerably more. The former inadequate salary is given as the chief reason for the decline in rate of recruitment for the police force and an increase to £8 per week is advocated.

In view of this article, and the present and suggested salaries of other professional men, I submit that the emoluments being paid and offered to veterinarians are such as to make the veterinary profession an object of ridicule. It is an accepted fact to-day that every professional man should be assured of a salary of at least £1,000 per annum at 40 years of age.

The medical and dental professions are going to obtain these conditions sooner or later, and we should regard it as our bond and our duty, to ourselves and to the posterity of the profession, to do likewise.

Yours faithfully,

PETER LAWTON.

135, Walton Road,
Walton, Warrington.